

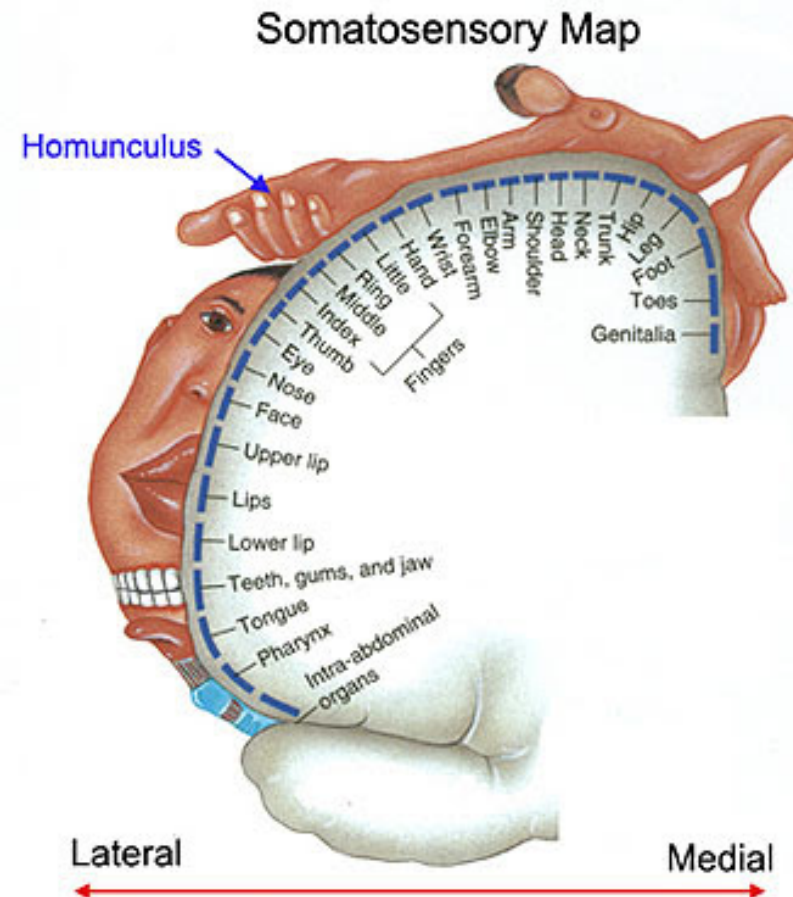
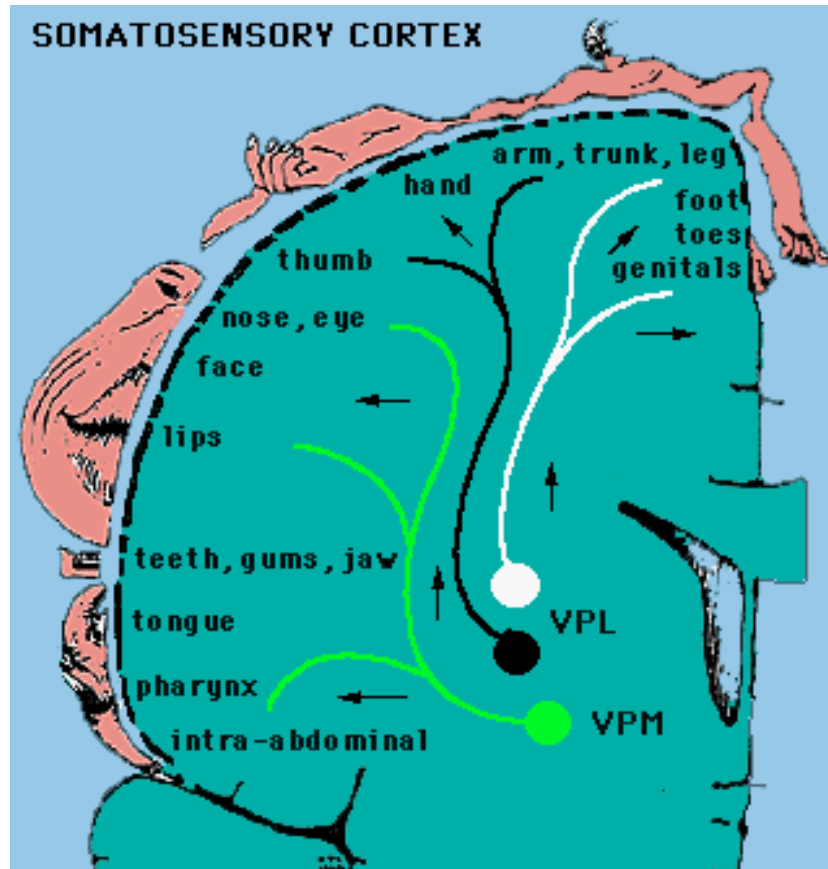
# Somatosensory maps

All bodies are unique and beautiful...

...but the brain is a scary place!

# Somatosensory map

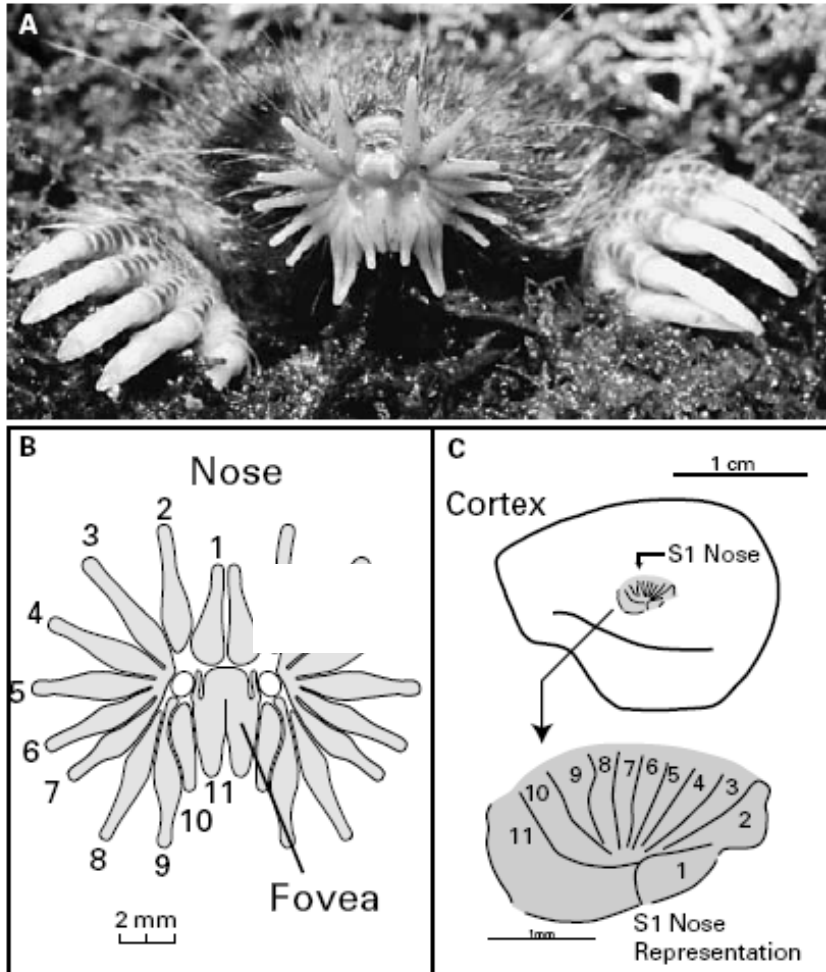
What do you need from a body map?



# The homunculus (Penfield and Rasmussen, 1960)

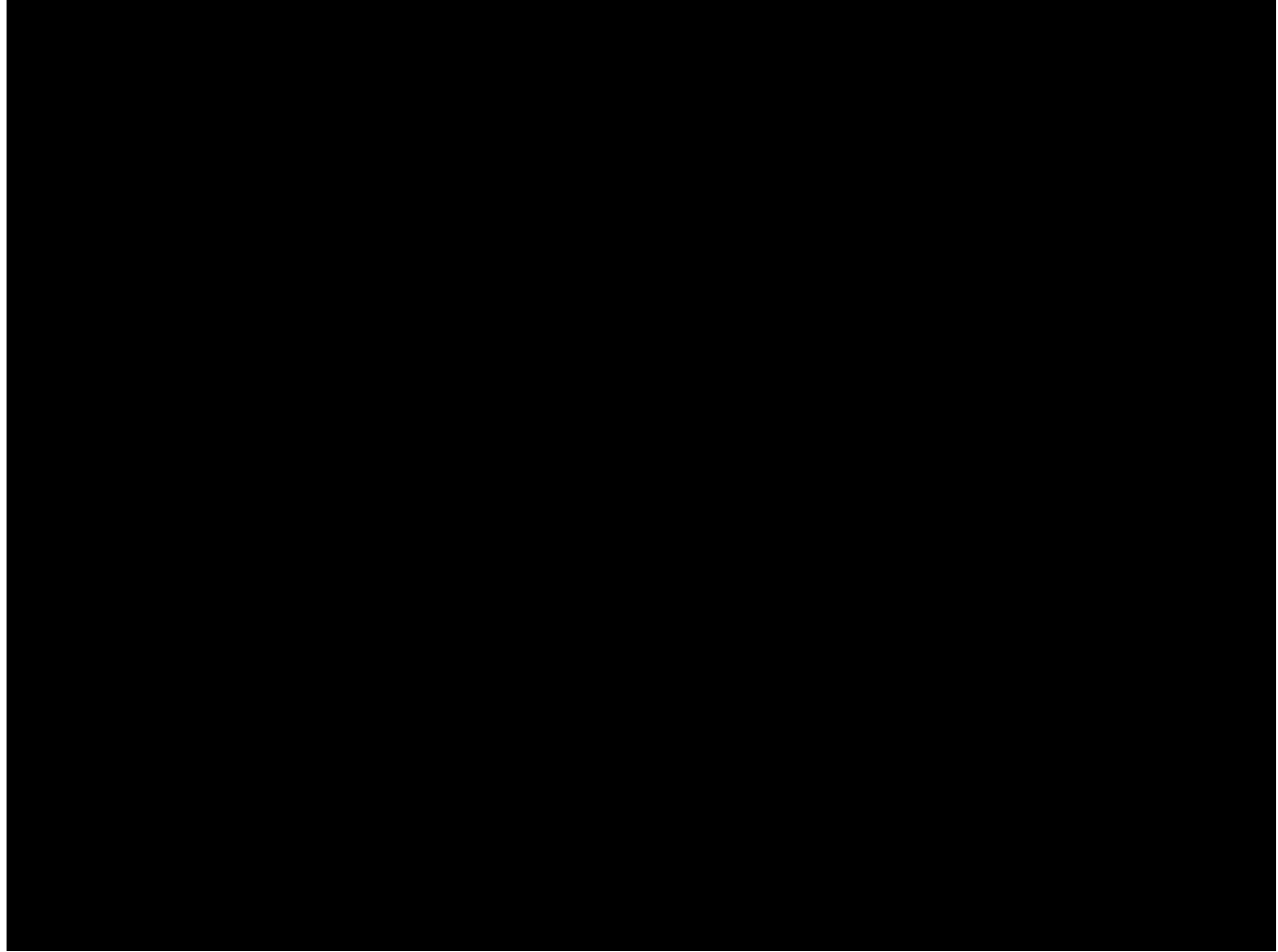


# The star-nosed mole

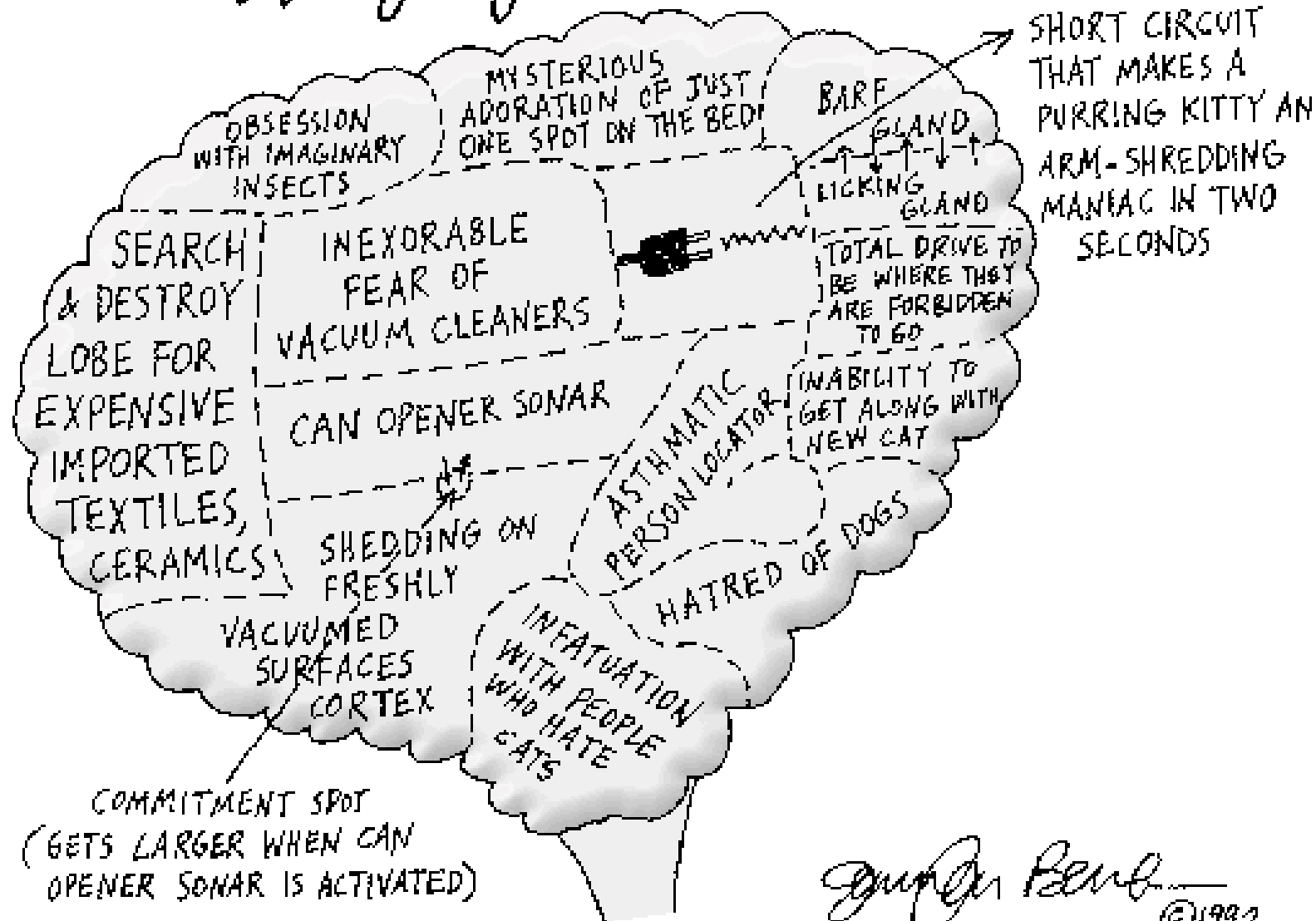


11 pairs of appendages ring the nose of the star-nosed mole

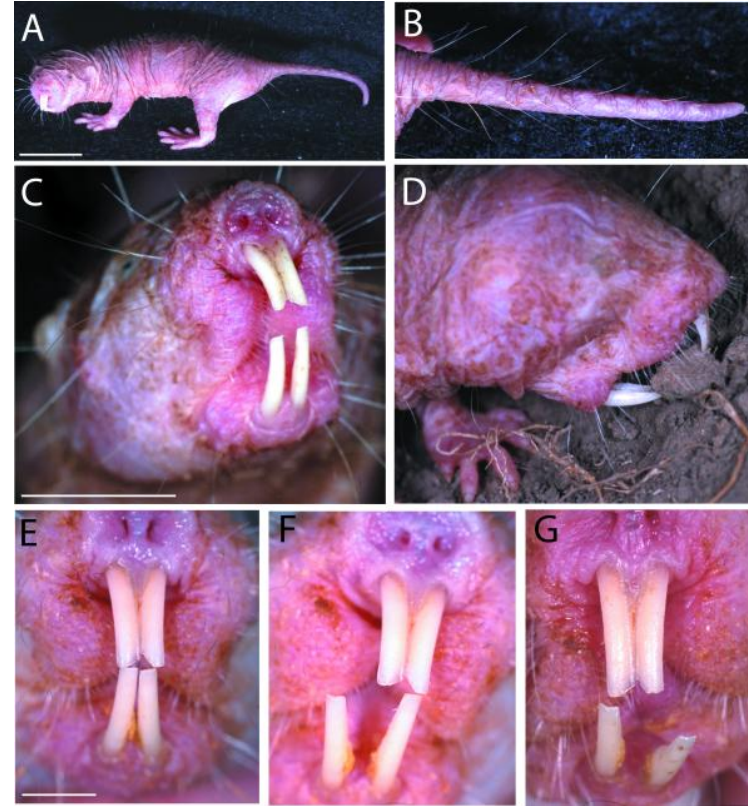
Note relative size of cortical representation of the appendages



# Mapping of the CAT BRAIN



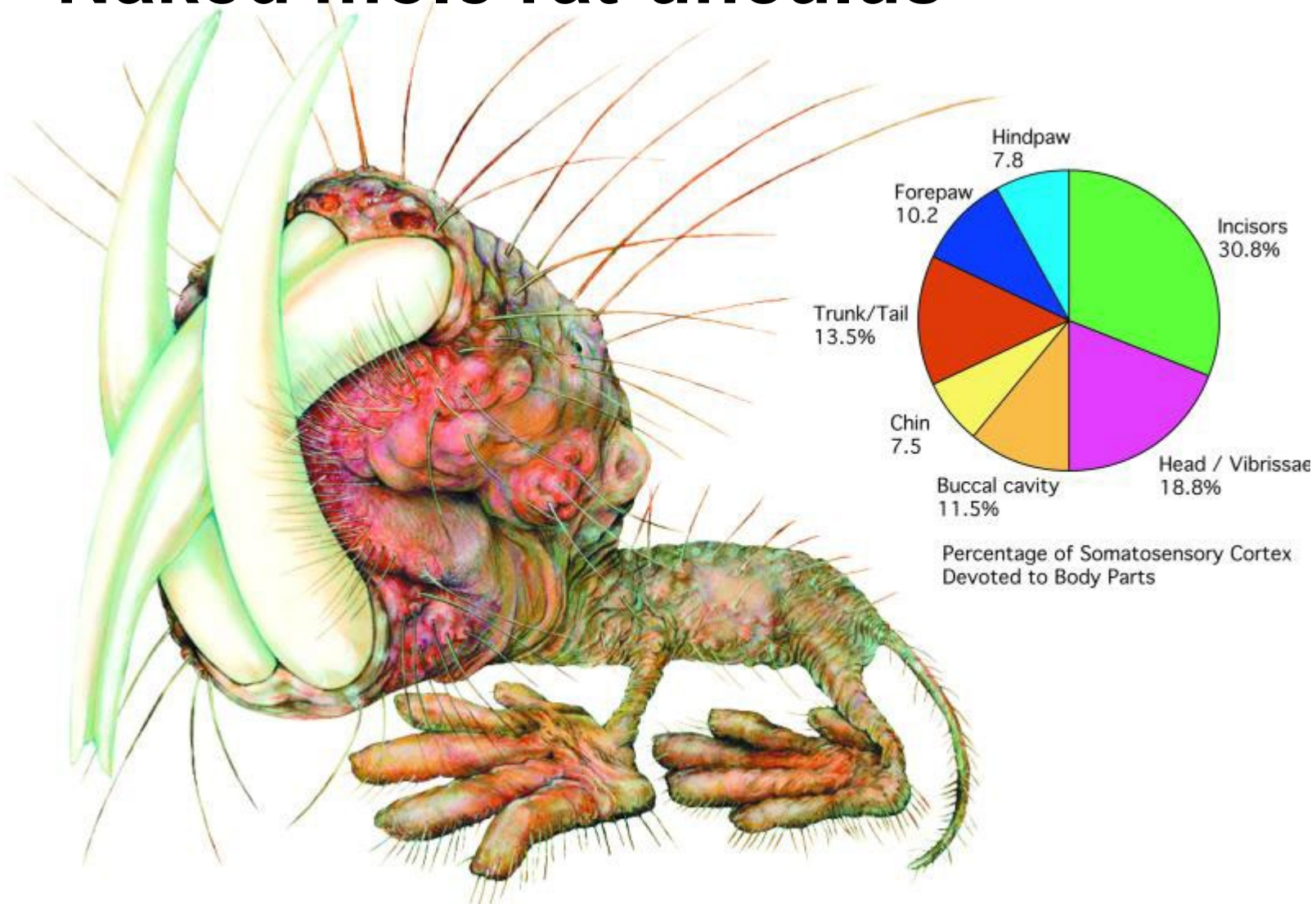
# Sensory representation in the brain



**Naked mole rat**

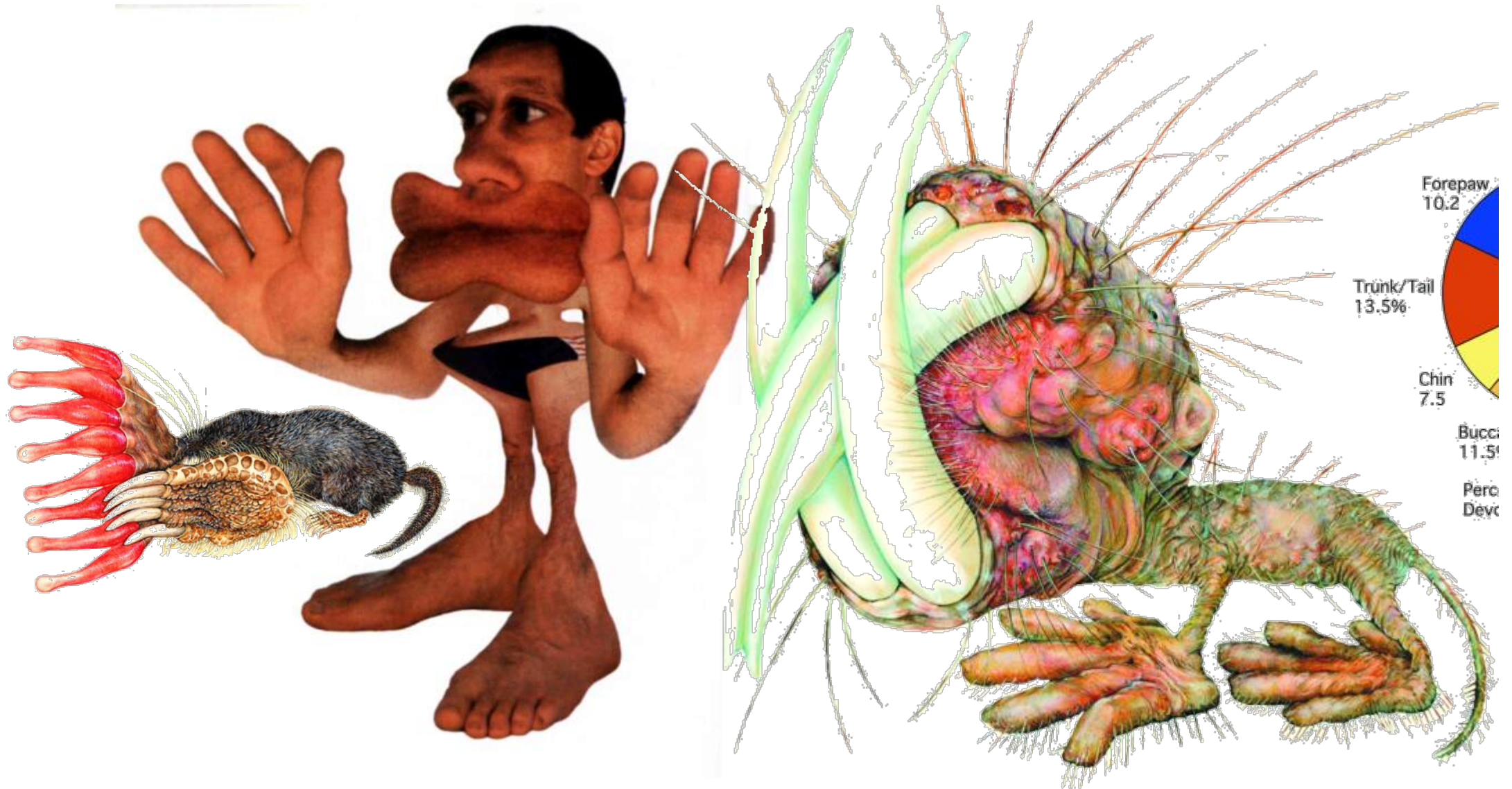


# Naked mole rat-unculus





# Important areas of the brain occupy more space



# Sensory representation after tooth removal:

Upper: normal

Lower: Five to eight months after the lower incisor was extracted, neurons in the tooth representation were activated by surrounding sensory surfaces on the face (lower panel).



# **What does the mole rat feel?**

**Consider human amputees who continue to feel phantom limbs:  
limited plasticity in adults**

**Cortical representation of amputated limb persists and gives a  
sensation = phantom limb**

# **Key concepts**

**Cortical representations of the body show the significance of individual body parts**

**The brain thinks we are all superheroes!**

**Damage or removal of a limb can lead to beneficial plasticity and reorganisation**

**Abnormal plasticity can also occur and may lead to pain and abnormal sensory experiences (phantom limb pain)**